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Statistical Series 96-40

Alberta's Energy Resources

1995 in Review

Alberta Energy and Utilities Board

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Conversion Factors Metric/Imperial Energy Equivalents

Almost all values used in *Alberta Energy Resources 1995 in Review* are metric. For Imperial units, use the conversions below:

Oil	1 cubic metre	= 6.293 barrels
Natural Gas	1 cubic metre	= 35.5 cubic feet
Coal	1 tonne	= 0.98 long ton (2240.6 lb or 1000 kg) = 1.1 short ton
Energy	1 petajoule Light Oil	= energy equivalent of 163 500 barrels
	1 petajoule Heavy Oil	= energy equivalent of 152 000 barrels
	1 petajoule Bitumen	= energy equivalent of 147 000 barrels
	1 petajoule Synthetic Crude Oil	= energy equivalent of 159 700 barrels
	1 petajoule Pentanes Plus	= energy equivalent of 190 100 barrels
	1 petajoule Ethane	= energy equivalent of 342 100 barrels
	1 petajoule Propane	= energy equivalent of 248 000 barrels
	1 petajoule Butane	= energy equivalent of 223 300 barrels
	1 petajoule Natural Gas	= energy equivalent of 904 600 000 cubic feet

Alberta's Energy Resources—1995 in Review

This publication is a review of energy resource activity in Alberta during 1995. It includes charts, graphs, and maps showing year-end production, reserves, drilling activity, markets and sales for Alberta's energy resources, and electric energy generation.

An expanded form of this publication, known as *Energy Alberta*, was distributed annually by the Energy Resources Conservation Board (ERCB) for many years. *Energy Alberta* highlighted major regulatory initiatives, reported on ERCB operations, and brought together statistical information about Alberta's energy sector on a calendar-year basis.

The ERCB and Public Utilities Board amalgamated in February 1995 to form the Alberta Energy and Utilities Board (EUB). The EUB is responsible for the orderly and efficient development of Alberta's energy resources and ensuring that Albertans receive safe and efficient utility service at rates that are just and reasonable.

Under new legislation, the EUB is streamlining the preparation of its annual report on operations and performance as part of the provincial Ministry of Energy. The new annual reporting process will be based on a fiscal year from 1 April to 31 March of the following year.

Alberta's Energy Resources—1995 in Review continues the statistical portion of the former *Energy Alberta*. This publication provides industry, media, government, the educational community, and the general public with an independent summary of energy resource sector activity for 1995.

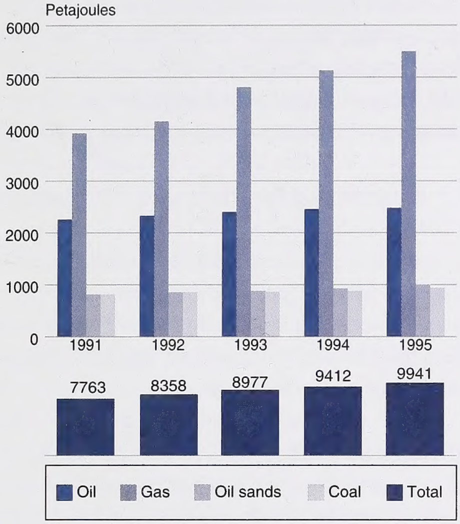
Alberta Hydrocarbon Production—An Overview

ALBERTA'S ENERGY RESOURCES—SUMMARY OF 1995 SALES

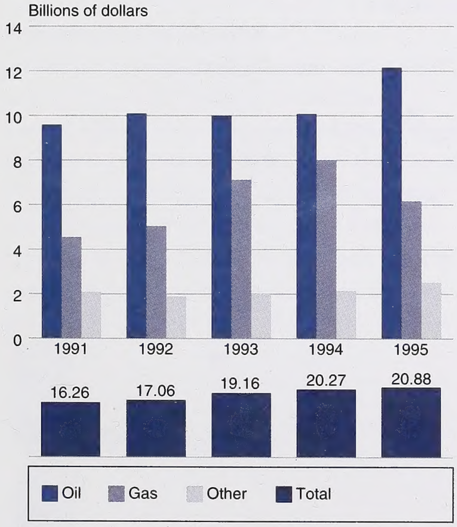
1995 Sales (petajoules)

	To Alberta	To Other Provinces	Exports	Total
Conventional Oil and Equivalent	811	956	1 775	3 542
Natural Gas and NGLs	975	1 447	2 791	5 213
Coal (Marketable)	493	33	285	811
Hydro	6	0	0	6
Total	2 285	2 436	4 851	9 572
Per cent of Sales	24	25	51	100

ALBERTA HYDROCARBON ENERGY PRODUCTION



GROSS REVENUE—ALL HYDROCARBONS



Total hydrocarbon production up in '95

Sustained levels of activity in all energy resource sectors pushed cumulative production of hydrocarbon energy production 5.6 per cent higher in 1995 compared to 1994. The largest increase occurred in the bitumen and synthetic crude oil category, with an 8 per cent increase, followed by a 7.2 per cent rise for natural gas and a growth of 5 per cent for coal. Conventional oil production increased just under 1 per cent.

Alberta as a net exporter of energy

Alberta continued to be a net exporter of energy resources in 1995. Export levels were especially high for natural gas and conventional oil, of which more than 80 per cent and 75 per cent went to other provinces and the U.S. respectively. About 70 per cent of coal produced in Alberta remained in the province, as did all of the hydropower. (See chart on p. 2.)

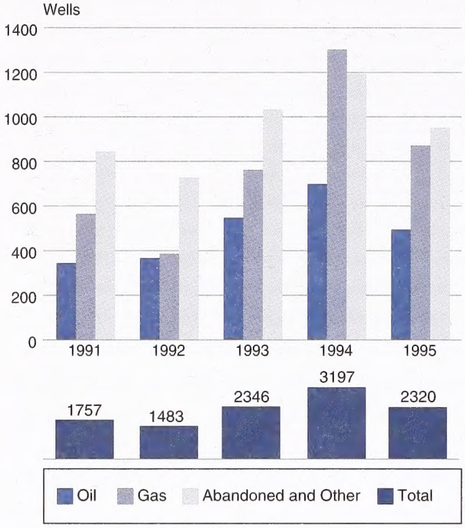
Oil still key in total energy revenue picture

Sales of Alberta hydrocarbons and sulphur totalled $20.88 billion in 1995, about 3 per cent higher than in 1994. The largest increase in revenues came from oil, which rose from just over $10 billion in 1994 to $12.18 billion in 1995, an increase of 20 per cent. Because of lower prices for natural gas, the value of this resource declined substantially from 1994 to 1995. Coal revenues increased just over 11 per cent.

Oil production accounted for 58 per cent of all 1995 energy sales, natural gas and related liquid and sulphur made up 39 per cent, and coal was 3 per cent of gross revenues.

Oil, Gas and Oil Sands Drilling Activity

OIL AND GAS WELLS—EXPLORATION



Oil and gas drilling down 5%

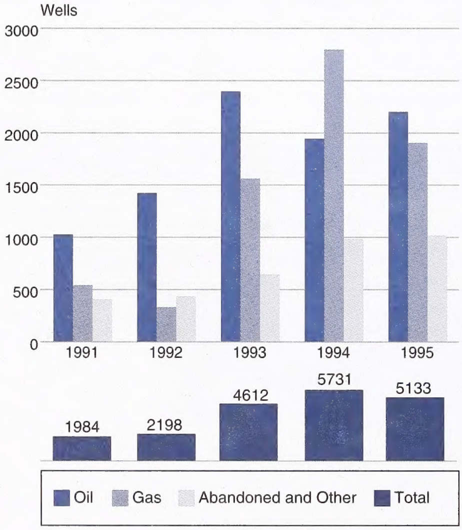
The total of 8652 wells drilled in Alberta in 1995 was less than the record set in 1994, but still above levels in many previous years. This brings to 167 000 the total number of all types of wells drilled in Alberta since well records started in 1902.

Oil development drilling in existing fields led with 2205 wells, followed by 1907 gas development wells. Gas well drilling led in the exploration category with 872 gas wells, followed by 496 oil wells. Overall, exploration drilling declined 27 per cent from 1994 to 1995, and development drilling dropped just over 10 per cent.

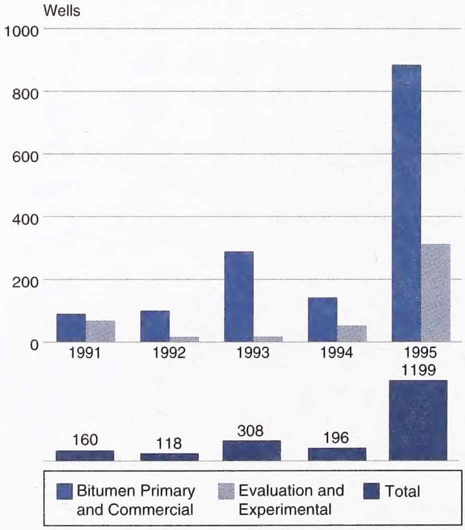
Oil sands drilling jumps

A major increase in oil sands drilling activity in 1995 resulted in 886 bitumen primary and commercial wells and 313 wells for evaluation and experimental purposes. Total oil sands drilling activity was up about six-fold from 1994. (See graph below.)

OIL AND GAS WELLS—DEVELOPMENT



OIL SANDS DRILLING



Well licensing results for 1995

The EUB issued a total of 9449 well licences in 1995. About 85 per cent of licensed wells are drilled each year, which explains the discrepancy between actual drilling activity and the number of licences. EUB records also include the category of “other” drilling activity, which includes abandonments, disposal and injection wells.

Active and capable wells

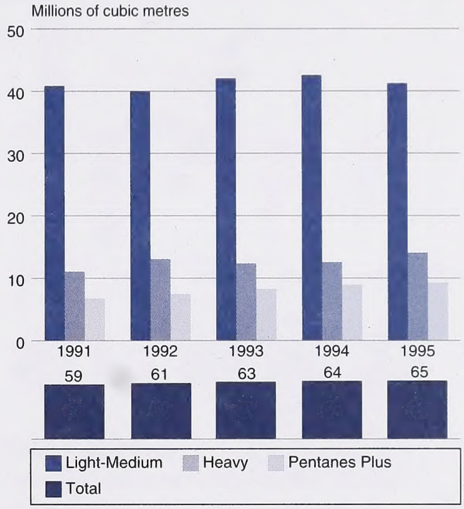
The EUB also tracks the number of active oil and gas wells in the province, that is, those showing production in a given month. For year-end 1995, there were 44 619 capable oil, heavy oil, synthetic crude oil and crude bitumen wells and 45 021 capable gas wells. Not all wells produce all the time; the average number of wells operating each month in 1995 totalled 28 750 oil and 34 800 gas wells. In addition, there were 8562 capped gas wells at the end of 1995, down 28 per cent from a peak number set in 1990.

Horizontal drilling important

Horizontal drilling techniques were used on 694 new wells in 1995, bringing the cumulative number of such wells to more than 1800. The vast majority are used in heavy oil and oil sands areas. A sporadic technology in Alberta until the late 1980s, the pace of horizontal drilling has grown dramatically since 1990, with horizontal wells making up just under 10 per cent of all drilling activity in 1995.

Oil and Oil Sands: Production, Reserves, Markets

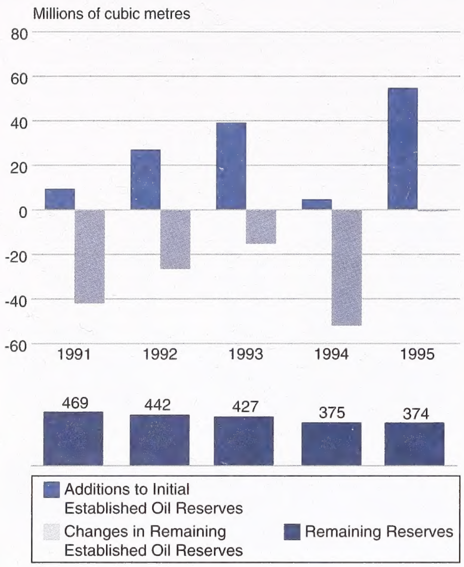
OIL AND PENTANES PLUS PRODUCTION



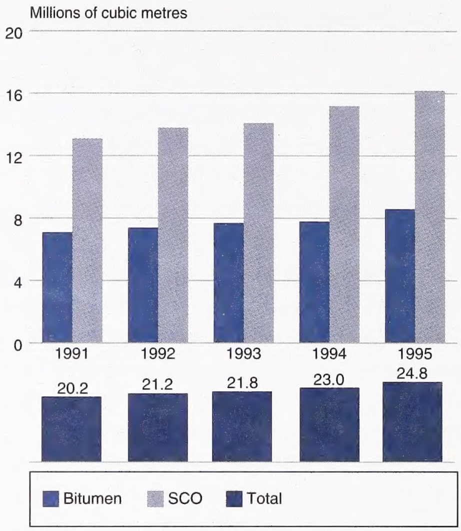
Conventional oil production up marginally

Alberta’s 1995 production of conventional crude oil and pentanes plus—a light crude oil equivalent produced in association with natural gas—totalled 65 million cubic metres, almost the same as the previous year. Quantities of light-medium oil were down about 3 per cent from 1994, while heavy oil production grew by 12 per cent and pentanes plus production increased slightly. Looking back 5 years, overall oil production has increased 6 per cent, with increases of 25 per cent for heavy oil and 36 per cent for pentanes plus.

CHANGES IN RESERVES



BITUMEN AND SYNTHETIC CRUDE OIL (SCO) PRODUCTION



The important link between production and reserves

Alberta's oil production peaked in 1973 and has continued to outpace additions to reserves since then. On the surface, it would appear that Alberta could "run out" of conventional oil in a relatively short time. As occurs every year, however, exploratory and development drilling and enhanced recovery result in reserves additions, which extend the remaining years for conventional oil. As well, synthetic crude oil from oil sands continues to assume greater importance as non-renewable, conventional oil reserves are depleted.

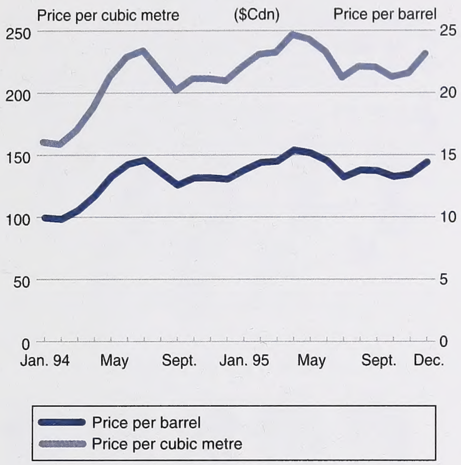
In 1995, industry activity added 55 million cubic metres to Alberta's initial established reserves of conventional crude oil. With oil production just slightly ahead of reserves additions, the province's remaining conventional reserves were 374 million cubic metres at year-end, down less than a percentage point from 1994.

Record year for oil sands

Bitumen and synthetic crude oil production reached record levels again in 1995 compared to the previous year. Production of bitumen and synthetic crude oil was up 7.8 per cent to almost 25 million cubic metres. Oil from oil sands activities now accounts for almost 30 per cent of Alberta's total oil production.

Initial established reserves of crude bitumen for 1995 from deposits under active development were 920 million cubic metres, with 644 million cubic metres of reserves from surface-mineable projects and 276 million cubic metres from in-situ schemes. Remaining established reserves of mineable and in-situ crude bitumen at year-end 1995 were estimated at 379 and 195 million cubic metres respectively from deposits under active development.

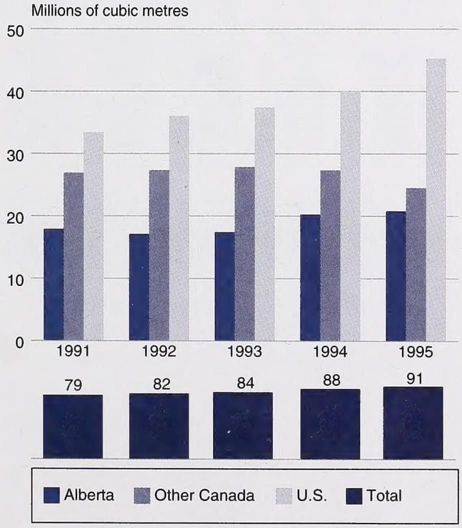
ALBERTA AVERAGE WEIGHTED FIELD PRICE FOR LIGHT OIL



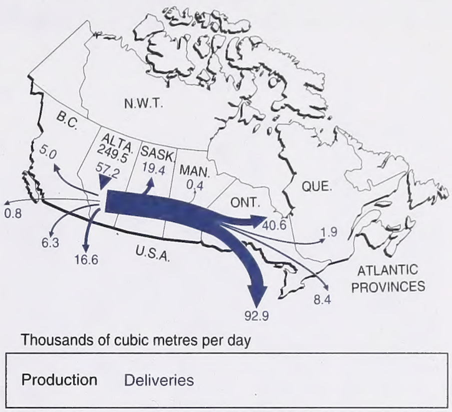
Average price best in 5 years

The 1995 weighted average field price for light and medium oil closed at $141.59 per cubic metre ($22.51 per barrel Cdn$) at year-end, the highest price in the past 5 years, and up more than 13 per cent from the 1994 average price. This strong performance was reflected in the gross revenue picture. (See p. 3.)

MARKETS FOR OIL



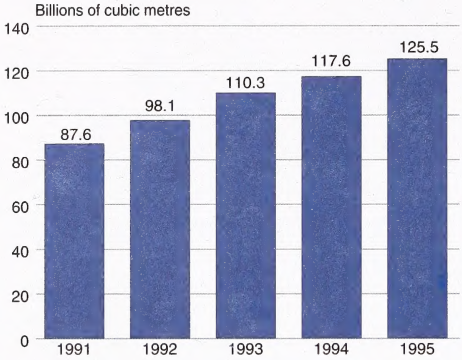
DELIVERIES OF OIL



More oil to U.S.

Total 1995 deliveries of Alberta oil, including synthetic crude oil from oil sands activity, were 91 million cubic metres, about 3.5 per cent higher than in 1994. About half of all Alberta's oil production was used in Canada, while the other half went to the U.S. Midwest. Just under 50 per cent of the Canadian portion stayed in Alberta for refining into other energy products, some of which are in turn exported from the province. The amount of Alberta oil that stayed in Canada in 1995 decreased by more than 10 per cent, with an equivalent increase going to the U.S. and a small amount offshore.

Natural Gas and Sulphur: Production, Reserves, Markets



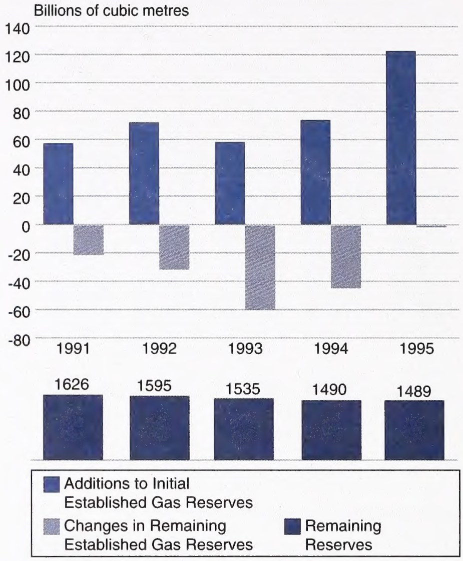
GAS PRODUCTION

Natural gas production up almost 7 per cent

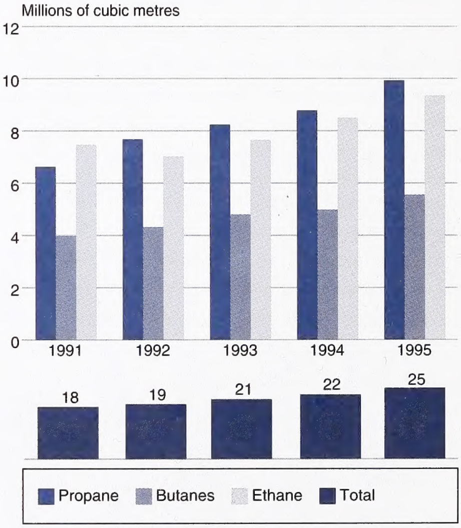
Despite falling prices throughout much of 1995, production of marketable natural gas rose by 6.7 per cent to a new record of 125 billion cubic metres for the year. Demand from the U.S. market was the key factor in this growth, accounting for about 70 per cent of the total increase of Alberta gas deliveries in 1995. (Marketable gas does not include gas produced and re-injected for pressure maintenance and enhanced recovery.)

Reserves additions equal to production

Additions to initial established reserves of natural gas saw a 123 billion-cubic-metre increase, due in part to relatively high levels of exploration and development activity during 1995. Reserves additions almost matched production, resulting in a net decrease in remaining established reserves of natural gas by 1.5 billion cubic metres to 1489 billion cubic metres by the end of 1995.



GAS RESERVES



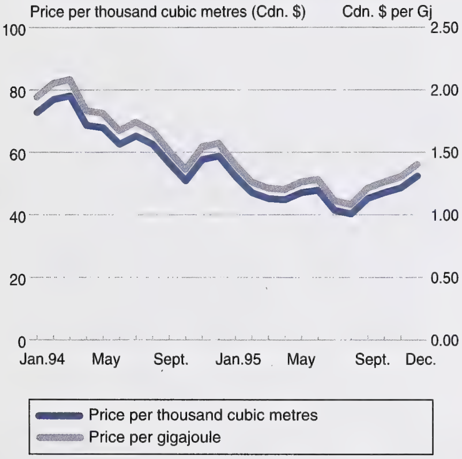
NATURAL GAS LIQUIDS PRODUCTION

Natural gas co-products on the increase

Stepped-up production of natural gas in recent years has resulted in increasing production of natural gas liquids (NGLs) such as propane, butanes, and ethane. These resources are used in the petrochemical industry, refining, and as energy sources. Pentanes plus are also produced with natural gas, but are accounted for as part of crude oil production statistics. (See p. 5.)

Total production of NGLs increased by 11.5 per cent to 25 million cubic metres in 1995 compared to 1994. A breakdown of this picture shows propane production increased almost 13 per cent, butanes 11 per cent, and ethane 10 per cent.

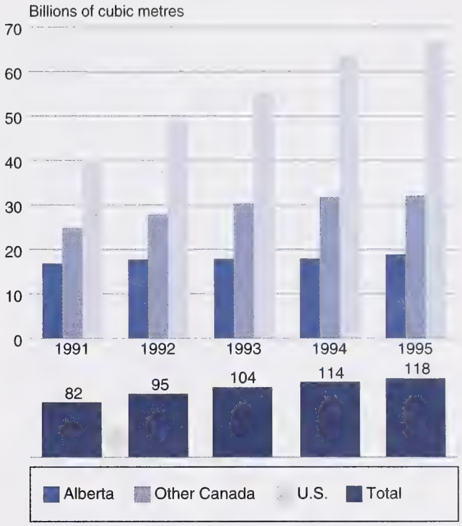
ALBERTA AVERAGE MARKET PRICE FOR GAS



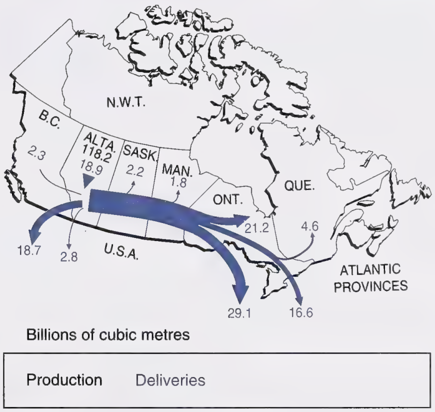
Average natural gas price drops in 1995

The 1995 average market price for Alberta natural gas was $46.78 per thousand cubic metres ($1.24 per gigajoule Cdn $), 28 per cent less than in 1994 and similar to prices experienced in the late 1980s. These numbers were reflected in the overall performance of natural gas in Alberta's gross revenue picture. (See p. 3.)

MARKETS FOR GAS



DELIVERIES OF NATURAL GAS

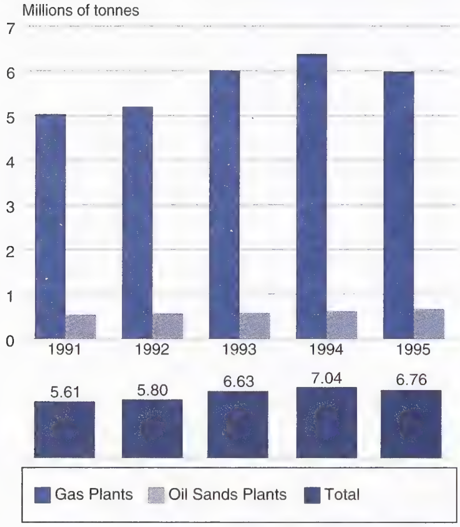


Gas sales up; not as much as previous years

Sales of Alberta natural gas increased 3.4 per cent in 1995 over 1994, to an estimated total of 118 billion cubic metres. This rise was lower than the 10-per-cent-plus increases of recent years.

Sales to the U.S. increased about 4 per cent, accounting for 57 per cent of the market for Alberta's natural gas. Alberta retained just 16 per cent of total gas production in 1995 for heating, petrochemical feedstock, and producing electricity. The rest of Canada consumed the remaining 27 per cent mostly for heating and petrochemical production.

SULPHUR PRODUCTION

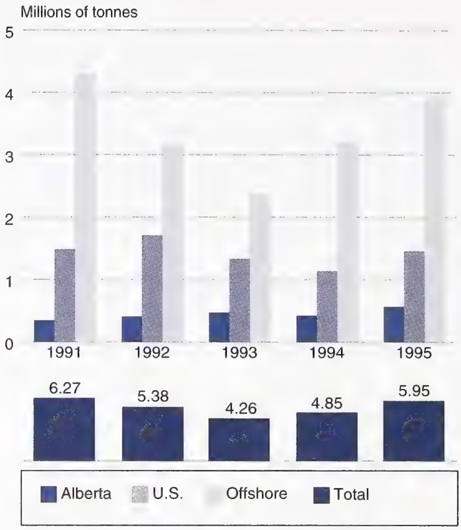


Sulphur markets recovering

Alberta is a leading producer of elemental sulphur because much of the province's reserves of natural gas contain hydrogen sulphide, which must be removed to produce clean gas. Since the Canadian marketplace cannot absorb such sulphur quantities, Alberta producers rely on export markets.

In 1995, Alberta producers continued to recover somewhat from the collapse of the worldwide sulphur market in recent years. Sulphur prices in 1995 recovered from a negative netback situation 2 years earlier, although prices were still much less than historical levels set in the '80s.

MARKETS FOR SULPHUR



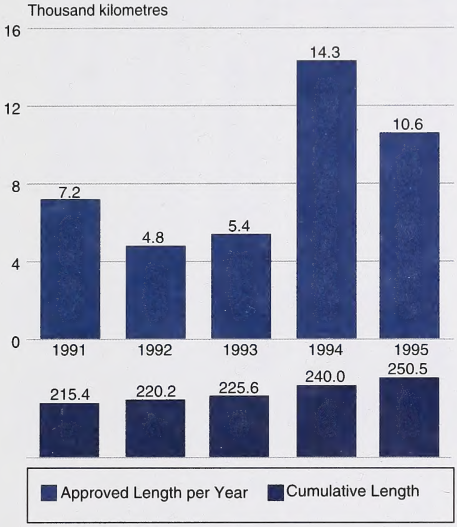
Sulphur sales improving

During the year, producers found markets for almost 90 per cent of the 6.76 million tonnes produced, up from just 69 per cent the previous year. This better match of markets to production still left 800 000 tonnes to pour to block, adding to the province's growing inventory of sulphur.

The main customers for Canadian sulphur in 1995 included the U.S. (25 per cent) and offshore countries such as Morocco, Brazil, South Africa, and Indonesia (66 per cent), with the remainder staying in Canada. Most of the sulphur exported from Canada is used to make fertilizer.

Pipelines

PIPELINE INSTALLED



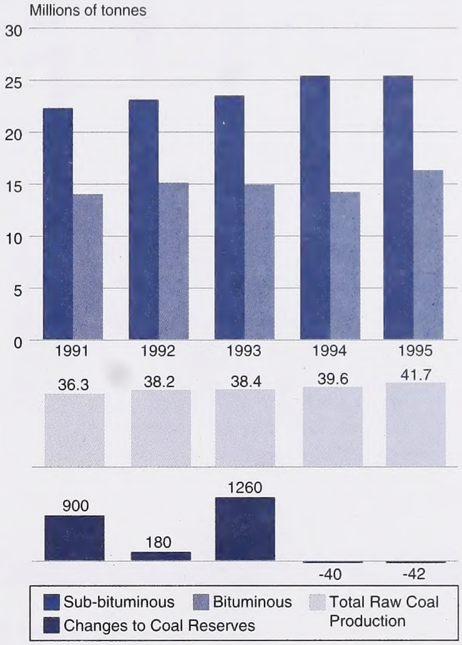
Quarter million kilometres of pipeline

During 1995, the EUB approved construction permits for 10 590 kilometres of intra-Alberta pipelines. This was down 25 per cent from the record level of pipeline activity in 1994, but well above levels for the past 5 years. These additions brought the total cumulative length of Alberta pipelines to 250 498 kilometres at year-end.

The Alberta portion of inter-provincial lines are regulated by the National Energy Board and not included in these statistics.

Coal

COAL PRODUCTION AND RESERVES

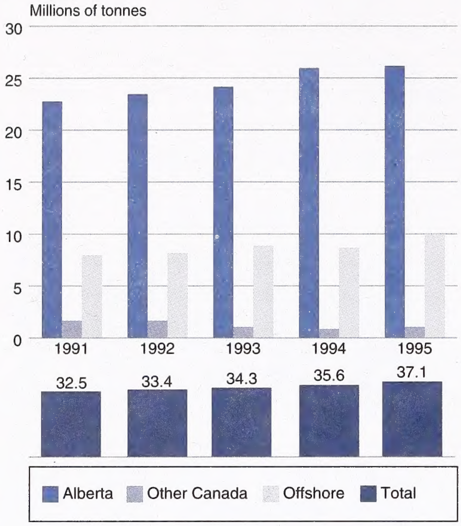


Coal production and reserves

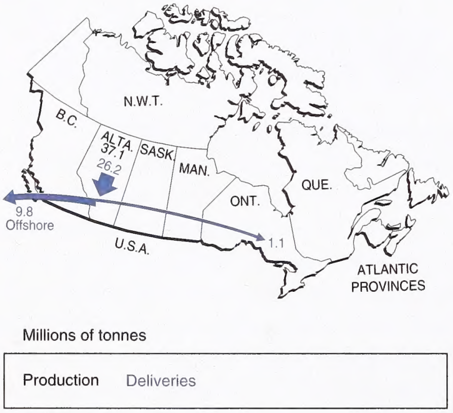
Alberta's raw coal production grew by more than 5 per cent in 1995 compared to 1994 to a total of 41.7 million tonnes. About 60 per cent of Alberta's coal is sub-bituminous and destined for coal-fired power plants. The remainder is bituminous coal, much of which is metallurgical and thermal coal used overseas to make electricity and steel.

Although Alberta's coal reserves declined by 42 million tonnes in 1995, the province's potential for coal development is enormous since much of the province is underlain by coal deposits. Coal reserves, recoverable by surface and underground mining techniques, stood at 34 billion tonnes at year-end.

MARKETS FOR COAL



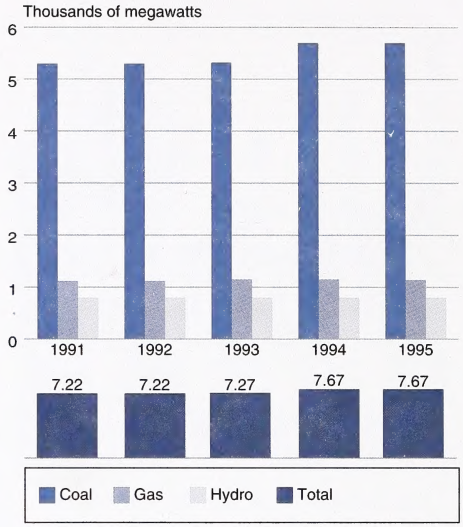
COAL DELIVERIES



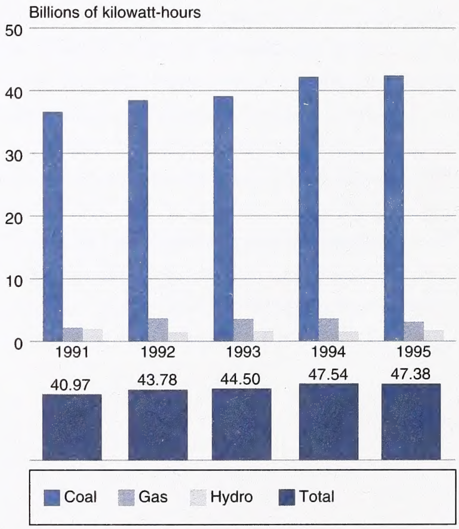
Total deliveries of marketable coal grew almost 5 per cent in 1995 to 37.1 million tonnes. Power-generating plants inside Alberta required just over 26 million tonnes, about the same as in 1994. Alberta offshore exports of metallurgical and thermal coal increased substantially to countries such as Japan, Korea, Brazil, and the United Kingdom, compared to the previous year.

Electricity

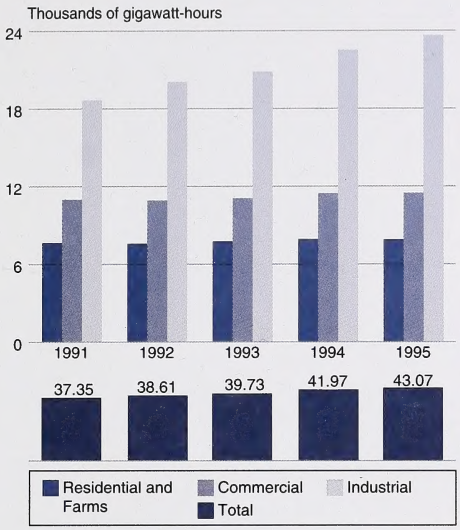
GENERATING CAPACITY



ELECTRICITY GENERATED



MARKETS FOR ELECTRICITY



Little change for electric energy

Alberta's electric utilities generated 47.38 billions of kilowatt hours of electric energy during 1995, virtually the same as in 1994. (See p. 12.) Demand for electricity grew by 2.6 per cent in 1995 compared to 1994. Industrial use of electricity grew 5 per cent, while farm, residential and commercial use was static. Coal supplied 90 per cent of the province's electrical generating needs, with gas and hydro at 6 and 4 per cent each.

In 1995, Alberta's electrical generating capacity was 7.67 thousands of megawatts, identical to 1994 levels. Generating capacity is electricity's equivalent to reserves of hydrocarbon resources. Capacity is always higher than demand to ensure reliability of supply for peak periods of demand.

Alberta in the Canadian Energy Picture

ALBERTA'S ENERGY RESOURCES—SUMMARY OF 1995 PRODUCTION AND RESERVES

		Alberta (petajoules)	Per cent of Canada	Total Canada (petajoules)
Remaining Reserves at the End of 1994	Conventional Oil and Pentanes	18 147	61	29 749
	Natural Gas and NGLs	68 268	83	82 251
	Bitumen	281 033	100	281 033
	Coal	692 600	63	1 099 365
	Total	1 060 048	71	1 492 398

		Alberta (petajoules)	Per cent of Canada	Total Canada (petajoules)
1995 Production	Conventional Oil and Pentanes	2 483	72	3 452
	Natural Gas and NGLs	5 503	86	6 409
	Bitumen and Synthetic Crude Oil	1 006	100	1 006
	Coal	943	49	1 916
	Hydro	6	1	1 190
	Total	9 941	71	13 973

Of all the energy produced in Canada in 1995, about 70 per cent came from Alberta. The province has just over 60 per cent of the country's conventional oil reserves and 83 per cent of natural gas reserves. The province's coal reserves make up 63 per cent of the national total. All of Canada's oil sands reserves are located in northern Alberta. The table above summarizes Alberta's place in the Canadian energy picture. The numbers show remaining reserves for 1994, marketable production at the end of 1995, and Alberta's proportion of Canadian oil, gas, and coal reserves.

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Our Mission

The Alberta Energy and Utilities Board is responsible for the orderly and efficient development of Alberta's energy resources and ensuring that Albertans receive safe and efficient utility service at rates that are just and reasonable.

EUB Alberta Energy and Utilities Board

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